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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,139	09/10/2003	Jing-Hsiang Hsu	JCLA9793	6888

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J.C. Patents  
SUITE 250  
4 VENTURE  
IRVINE, CA 92618

EXAMINER

LUM, LEON YUN BON

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/660,139	<b>Applicant(s)</b> HSU ET AL.	
	<b>Examiner</b> Leon Y Lum	<b>Art Unit</b> 1641	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 6-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>20041005</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I, claims 1-5 in the reply filed on 15 September 2004 is acknowledged.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In claim 1, lines 4-5, the phrase "modify a surface of the micro-carrier to an aminated surface" is vague and confusing. It is unclear whether there are two surfaces, a micro-carrier surface and an aminated surface, wherein the micro-carrier is attached to the aminated surface, or whether the micro-carrier surface is modified so that it becomes the aminated surface. Applicant is invited to clarify the limitation.

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5. Claim 2 recites the limitation "silicon dioxide surface" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. The instant claim recites a silicon dioxide layer (line 3 of the instant claim). However, there is no mention of a silicon dioxide surface and it is not clear whether the silicon dioxide surface claimed in line 4 is the same as the silicon dioxide layer in line 3.

6. In claim 2, line 4, the term "using" is vague and indefinite. The specification does not define the term and it is unclear how the 3-aminopropyltriethoxysilane (line 4) is used to modify the silicon dioxide surface (line 4).

7. In claim 2, lines 4-5, the phrase "modify the silicon dioxide surface of the micro-carrier to the aminated surface" is vague and confusing. It is not clear whether the silicon dioxide surface is being changed into the aminated surface or whether the modification is performed on the silicon dioxide surface without changing it into the aminated surface. If the claim is directed only towards modification of the silicon dioxide surface without changing the surface into an aminated surface, then it is unclear how the aminated surface relates to the silicon dioxide surface in the claim as presented.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Cattell (US 6,180,351 B1).

Cattell reference teaches a fabrication method for a biochip, comprising providing a micro-carrier, wherein the micro-carrier is already labeled with an identification code, performing a surface modification procedure to modify a surface of the micro-carrier to an aminated surface, and performing a solid-phase peptide synthesis step to synthesize a peptide with a specific amino acid sequence on the aminated surface of the micro-carrier, by disclosing a method of generating an addressable array of chemical moieties on a substrate, wherein the chemical moieties are peptides, wherein an identifier is applied to the substrate carrying the array (column 2, line 60 to column 3, line 5), wherein the arrays are fabricated by deposition of the moieties onto the substrate (column 9, lines 6-59), and wherein the surface can be modified with one or more different layers of compounds that serve to modify the properties of the surface in a desirable manner (column 14, lines 8-10).

With regards to claim 5, Cattell reference teaches that the identification code on the micro-carrier is a bar code, by disclosing that a local bar code can be printed on the substrate (column 9, lines 60-65 and Figure 1).

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10. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nova et al (US 5,874,214).

Nova et al reference teaches a fabrication method for a biochip, comprising providing a micro-carrier, wherein the micro-carrier is already labeled with an identification code, performing a surface modification procedure to modify a surface of the micro-carrier to an aminated surface, and performing a solid-phase peptide synthesis step to synthesize a peptide with a specific amino acid sequence on the aminated surface of the micro-carrier, by disclosing a method that provides matrices with memories, wherein the matrix material can be used in peptide synthesis (column 6, lines 54-65), wherein surface modification of the matrix material can be performed by introducing free amino or carboxyl groups onto a silica matrix in order to attach biological molecules (column 24, lines 13-38, especially lines 13-18), and wherein the matrices can be encoded with a pre-programmed identifying bar code (column 34, lines 1-3).

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nova et al (US 5,874,214) in view of Cozzette et al (US 5,063,081).

Nova et al reference has been disclosed above and additionally teaches that the matrix can be a silicon chip (column 12, line 47-63, especially line 62), but fails to teach that the surface modification procedure comprises covering the surface of micro-carrier with a silicon dioxide layer and using 3-aminopropyltriethoxysilane to modify the silicon dioxide surface of the micro-carrier to the aminated surface.

Cozzette et al reference discloses a biosensor wherein a silicon substrate is layered with silicon dioxide, in order to provide a non-conductive layer, and further modified with a silane layer, wherein the silane is 3-aminopropyltriethoxysilane, in order to provide a semipermeable solid film which promotes adhesion of subsequent layers of other materials (column 26, lines 4-12; column 29, line 62 to column 30, line 15 and Figures 1-2), wherein a subsequent layer is a biolayer that incorporates a biologically active molecule that can be screen-printed or dispensed on the solid phase (column 39, lines 6-13 and Figure 2), and wherein the biologically active molecule can be polypeptides (column 19, lines 33-45, especially lines 33-34 and 37).

It would have been obvious at the time of the invention to modify the method of Nova et al with a biosensor wherein a silicon substrate is layered with silicon dioxide, as taught by Cozzette et al, in order to provide a non-conductive layer, and further modified with a silane layer, wherein the silane is 3-aminopropyltriethoxysilane, as taught by Cozzette et al, in order to provide a semipermeable solid film which promotes adhesion of subsequent layers of other materials, including a biolayer of polypeptides. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in modifying a biochip with silicon dioxide and 3-aminopropyltriethoxysilane, as taught by Cozzette et al, in the method of Nova et al, since Nova et al teaches matrix chips that can be made of silicon, and the silicon dioxide layer taught by Cozzette et al can be used to modify silicon surfaces.



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15. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nova et al (US 5,874,214) in view of Wu et al (US 5,922,161).

Nova et al reference has been disclosed above and additionally teaches that the matrix can be any solid support, including polymers (column 12, lines 47-63, especially lines 54-56), but fails to teach that a material for forming the micro-carrier is a high molecular weight material or comprises polyethylene terephthalate (PET).

Wu et al reference discloses the polymeric materials of ultra high molecular weight polyethylene and polyethylene terephthalate, in order to provide materials that can be surface modified for adhesive bonding, coating, and biocompatibility (column 3, line 57 to column 4, line 12; and column 2, line 63 to column 3, line 5), wherein the modified polymeric materials can be used for immobilization of biological materials (column 10, lines 55-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Nova et al with polymeric materials of ultra high molecular weight polyethylene and polyethylene terephthalate, as taught by Wu et al in order to provide materials that can be surface modified for adhesive bonding, coating, and biocompatibility, wherein the modified polymeric materials can be used for immobilization of biological materials. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in using ultra high molecular weight polyethylene or polyethylene terephthalate, as taught by Wu et al, in the method of Nova et al, since Nova et al teaches peptide synthesis on surface modified matrices that can be produced from polymers, and the ultra high molecular weight polyethylene

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or polyethylene terephthalate materials are types of polymers that can be surface modified for binding applications.

### ***Conclusion***

16. No claims are allowed.

17. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

Cattell (US 6,180,351 B1) teaches peptide synthesis on biochips, wherein the supports incorporate identification codes and surface modification.

Gordon et al (US 6,251,595 B1) teach a substrate with surface modification, identification codes, and peptide synthesis on the substrate.

McFarland et al (US 6,182,499 B1) teach peptide synthesis on sensor substrates with bar codes in predefined regions on the substrates.

Hendrickson et al (US 4,757,014) teach immobilization of biological materials on polyethylene terephthalate supports modified by silicon dioxide.

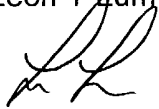
18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Y Lum whose telephone number is (571) 272-2878. The examiner can normally be reached on 8:00am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leon Y Lum



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10/15/04